

the 413 billion barrels below the earth's surface.

"All that tweaking and adjusting of sand, gels and fluids can result in a little incremental increase in the recoverable percentage of oil," Zarling said. "Well, one percentage point of 413 billion barrels is a lot of barrels. So it is all about tweaking the technology."

But the one slice of technology that is creating quicker timelines and greater efficiency is software and connectivity. Kerry Frank, CEO of software company Comply365, is seeing first hand how the advent of iPads, upgraded digital networks and custom software is contributing to the Bakken boom.

"Time is money out here," Frank said. "If a safety document takes eight hours to travel in a car before the next step even happens, that's millions of dollars in some cases."

Frank continued with an example of a gas inspector out on location noticing a pipe that is corroded past a comfort level. The inspector would have to indicate the change, drive to a location to fax, email or upload the change. Then, the corporate office would have to make the change, process the work order and adjusted paperwork and work force would have to make it back to the location.

"We literally made a map of all the locations and personnel the form goes. It was crazy," Frank said. "In oil and gas something like safety can affect the entire industry. The combination of mobile technologies and software allow us to create a safety community of best practices."

Hymel knows how rapid technology changes and the slice of technology Frank and Comply365 are providing in the Bakken. However, has a difficult time monetizing a mobile enterprise system.

"The hard part is putting a dollar figure on it within a corporation. There is a savings ripple that is hard to track when these softwares are implemented," Hymel said. "So technically, you could put a dollar figure on it once you flesh out your entire organization's workflow. Then you can say we are saving 'X' amount of time



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Workers adjust piping during a short pause in water pumping during a natural gas hydraulic fracturing operation at an Encana Oil & Gas (USA) Inc. drilling site March 29, 2013, outside Rifle, in western Colorado. The first experimental use of hydraulic fracturing was in 1947, and more than 1 million U.S. oil and gas wells have been fracked since, according to the American Petroleum Institute. The National Petroleum Council estimates up to 80 percent of natural gas wells drilled in the next decade will require hydraulic fracturing.

on compliance issues with fines and fees, and those other pieces of your organization's puzzle. It's actually amazing what technology can accomplish."

Alex Warner, CEO, Pedigree Technologies, said connectivity "isn't an issue as much" anymore in the Bakken due to upgraded technologies like networks and satellites.

"Typically for us, it's not a problem because if we can field the hardware, which we usually do, we can link from anywhere, not only out in places like the Bakken but anywhere in the world," Warner said.

Remote sensors, new safety guidelines and PHMSA regulations will increase speeds and technology investments once again as companies upgrade both equipment and software to accommodate and anticipate future regulations stemming off the Tioga spill and Casselton derailment.

"The oil and gas industry is adopting technology pretty radically. We can use technologies to monitor, track, manage equipment and streamline logistics with cellular networks and data networks," Warner said. "Everyone wants to make the whole oil and gas delivery process and service process very streamlined and so the educational market is

already there."

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"The next time you are out in the field and you see a drill rig two miles away, just think about the geodriller inside that shack behind a couple of joysticks and screens," Zarling said. "He has that drill thousands of feet below your feet, miles away and can punch a hole through a pie plate. That's amazing technology. That's science. That's math. That's engineering." ■

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